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A strategic model of enduring strikes

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Abstract

Over the past decades, rapidly changing circumstances have posed serious challenges to European trade unions. Faced with declining membership and increasing dependence on external funding, unions have sought new strategies to retain their influence in economic decision making. In several western European countries, this resulted in increased institutionalization of unions combined with a rise in professionalism of union leadership. This evolution calls for a strategic approach in studies of strike occurrences, particularly when these strikes are targeted against the government. Nowadays, union leaders have a clear view of the government's room for maneuver and its vulnerability to strikes. Therefore, an empirical study of strikes against the government should take into account that the start of an enduring strike is a deliberate decision of forward-looking union leaders. In this paper, we present a strategic model of trade union strikes against the government. Using the statistical backwards induction methodology developed by Bas, Signorino and Walker's (2008), we estimate the determinants of unions' and government's behavior and payoffs. We find that governments are more susceptible to pressure when their popularity is increasing and elections are near. In a strategic framework, this finding is not irreconcilable with the observation that long-lasting conflicts are more likely to occur under these specific circumstances.

- Keywords: Strikes, Unions, Government Concessions, Strategy, France.

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1 Introduction

Over the past decades, European trade unions have been challenged profoundly by the forces of economic internationalization and the decay of the traditional backbone of their power, i.e. a homogenous working class. These forces have resulted in decreasing membership statistics, and increased dependence on government funding (Visser, 2012). Despite these problems, European trade unions are still crucial to the governance of European economies. They are organized strategic actors speaking for a large and historically important social movement. Therefore, unionism in Europe is no relic from the past, and it remains important to study how unions intervene in the policy making process and defend the interests of their members.

Given the rapidly changing circumstances, European trade unions must constantly make choices about their identities, their goals, and who their opponents and allies are. They have managed to adapt themselves to the changing environment with varying success. A common trend observed in several Western European countries (Belgium, France, Italy, The Netherlands) is the professionalization of union leadership and management. Until the early 1980's, these unions felt that their role was to support the spontaneous actions of their members and to develop this action within the context of larger protests against the government and against the employers (Slomp, 1998). Nowadays, activists have been replaced by professional representatives who control cartels of non-grass-root unions. Their goal is no longer to increase membership rates or encourage social mobilization. Instead, trade unions' representatives spend most of their time negotiating with the government or employers organizations. These institutionalized unions are not funded by their membership, but are heavily subsidized by the state, local authorities and employers (Andolfatto and Labbé, 2012).

In this paper, we investigate the consequences of the change in organizational structure and professionalism with respect to the occurrence of strikes against the government. We analyze data on all French strikes targeted against the government over the period 1988-1995. We use statistical backward induction, and provide evidence that unions do not merely support spontaneous actions of their members, but rather demonstrate professionalism in the strategic timing of enduring strikes. We show that the likelihood of government concessions increases with the probability of reelection. However, strategic behavior of union leaders can explain why we also observe more enduring conflicts (without concessions) when elections are near and government approval increases.

In the next section, we discuss the changing characteristics of French unionism in the past decades. Like in many other European countries, French unions are coping with

decreasing membership rates and changes in the system of representation. Furthermore, unions' funding channels have been modified thoroughly, and their relationship with respect to the government and political parties changed considerably. In general, we can say that unions are by now more institutionalized representative organizations that display a high level of professionalism. This trend towards professional institutions that maintain close relationships with the government and employers organizations has often been used to explain the decrease in the number of industrial conflicts. Others (e.g. Martin, 2010) have pointed out that conflict can often be avoided, because professional unions only revert to industrial action when they reckon that they have a good chance of getting the desired concessions. Our paper should be situated in the second line of reasoning.

In the third section, we describe the data. We use data from four different sources, which allows us to examine the relationship between strike activity, political approval ratings and political and economic circumstances in detail.

The fourth section presents our empirical analysis. We use statistical backwards induction to estimate which factors determine the strategic behavior of the government and the unions. We focus on the effect of electoral pressure on the government's choice of action and on strike occurence. Furthermore, we present counterfactual analyses to assess the impact of the quasi-constitutional power sharing arrangements for divided governments.

We conclude that the government is more (less) likely to make concessions when its popularity is increasing (decreasing) and elections are near. When elections are still far away, the government is more likely to stand firm. Furthermore, we learn that if unions take the governments expected reaction into account when deciding to initiate a longer strike, our findings should not be dismissed by the observed correlation between the occurrence of enduring industrial conflicts and weak governments.

2 The Professionalization of Union leadership in France.

In this section, we briefly discuss how French unionism changed over the past decades. The observed developments towards professionalism, bureaucratization and a top-down decision-making process in matters of industrial action provide support for our claim that strikes against the government should be modeled in a strategic fashion. Figure 1 displays the density of unionization in France over the period 1949 – 2009. Between 1958 and 1978, more than a quarter of French workers were unionized. During these years of rapid

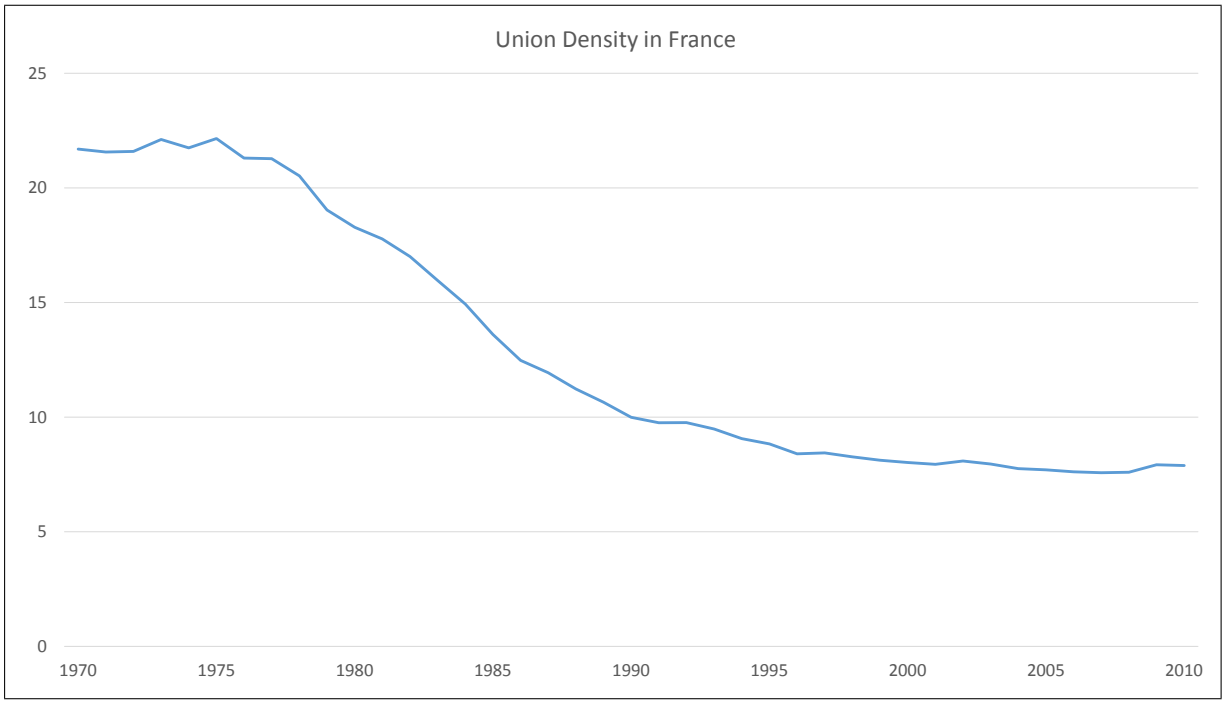

Figure 1: Union Densities (1970-2010)

economic growth, the French workforce increased from 13 to 18 million and was profoundly transformed and rejuvenated. The maintaining of the rate of unionization at the same level indicates that there was a significant increase in membership. In other words, during the "trente glorieuses", the French trade unions adapted themselves to changes occurring in the labor market: the arrival of the baby boom generation, feminization of the workforce, the rise of the service sectors and of the white collars. During this period, the rate of unionization in France was lower than in Germany, in Scandinavian countries and in Belgium, but it was comparable to that of North America and Italy, at least until the early 1970s.

Until the early 1980s, the major activity of French trade union activists was to provide individual assistance to their members to protect them against dismissal, sanctions, arbitrary transfers, bullying. These activists had to resolve many problems of everyday life at work: poor working conditions, dangerous equipment, unsociable hours, refusal to give holidays, unpaid premiums, etc. This assistance could extend beyond the workplace to include help with housing problems, procedures with social security funds, etc. This function of "legal defense and formulation of demands" has become unpopular among political activists because it was time consuming, but it was nevertheless accepted by the militants because it allowed to collect union dues and to gain members, sympathizers and voters.

In 1975, the number of unionized workers was about 4.5 million, that is to say a union

Union	Number of members (2003)
Confédération Générale du Travail (CGT)	540 000
Confédération Française Démocratique du Travail (CFDT)	450 000
Force Ouvrière (CGT-FO)	300 000
Union Nationale des Syndicats Autonomes (UNSA)	135 000
Fédération Syndicale Unitaire (FSU)	120 000
Confédération Française des Travailleurs Chrétiens (CFTC)	100 000
Confédération Générale des Cadres (CFE-CGC)	90 000
Union syndicale Solidaires (SUD)	80 000

Table 1: French Unions and Membership Rates

density (rate of unionization) of nearly 25 %. Not only were these members a physical reality but they were loyal to their organization - their average seniority was over 10 years - and a significant minority were prepared to bring, in addition to its membership fees, a voluntary contribution to some of their unions' activities. At that time, much of the life of trade unions relied on volunteer activists who gave dynamism and efficiency to these teams.

Between 1978 and 1988, the rate of unionization was halved, which means that very many members left their unions while recruitment dried up. Subsequently in the 1990s and 2000s, this decline continued without interruption, but at a slower pace. Despite repeated assertions, this decline has not yet been halted.

In 2003, membership was only 1.7 to 1.9 million, that is to say around 7 % of the total workforce of 23.5 million French workers. This is the lowest rate of all the OECD countries, alongside with Turkey (Visser, 2011). Union members were shared among seven main unions, as can be seen in Table 1.

These numbers tell only a part of the story. If we study these statistics in greater detail, the changing nature of French unionism gets even more clear. For example, in 2003 two thirds of the union members were working in the public sector or in public companies. In the private sector, less than one employee out of 20 is unionized. Furthermore, 13 percent of the union members are retirees. A final observation is that a large part of the remaining members devote more than halve of their working time to union activities. These members are paid by their employers, but part of their salary stems from state or local authorities' subsidies. These observations may support the claim that unionism has become much more professional over the past three decades.

The professionalism and institutionalization of French unions calls for a strategic approach in studies of strike occurrences. In comparison with the initiators of a spontaneous

strike in a small factory, union leaders have a clear view of the government's room for maneuver and its vulnerability to strikes. Therefore, an empirical study of strikes against the government should take into account that the start of an enduring strike is a deliberate decision of forward-looking union leaders. Before we describe our empirical approach, we briefly discuss the data.

3 Data

Our dataset comprises data from five different sources. All data concerning the strikes were obtained from the "European Protest and Coercion Dataset", developed by Ron Francisco at the University of Kansas (Francisco; 2000, 2011). This dataset consists of a very extensive list of protests and repressive events such as strikes, occupations, riots, etc. in 28 European countries from 1980 through 1995. We only use data on conflicts between unions or professional organizations and the government in France. The conflicts must have economic roots, i.e. a demand for wage increase or dissatisfaction with labor policy or social policy. Furthermore, we only kept the events that were coded as a strike for at least one day. Some of these events have additional qualifications such as demonstration, occupation or obstruction.

Data on union densities and total membership were obtained from Ebbinghaus and Visser (2000). The concentration measures (Herfindahl-Hirschman and C3 indices) as well as the relative strength of the confederations of French unions within certain industries were computed using the same dataset.

Approval rates for the French president and prime minister were obtained from the website of professor Richard S. Conley. These data were originally collected for his paper "From Elysian Fields to the Guillotine? The Dynamics of Presidential and Prime Ministerial Approval in Fifth Republic France".

The data on budget deficits were collected from the website of the world bank.

Finally, data on political characteristics of the government (ideological dispersion of the government, minority cabinet or minimum winning coalition, cohabitation, left or right government) were obtained from the Comparative Parliamentary Democracy Data Archive (Strom, Müller and Bergman, 2008).

4 Empirical analysis

In this section, we present a model of statistical backward induction to estimate the determinants of unions' and the government's actions and utility levels during strikes. Before we discuss the key model applied in this paper, we explore some prima facie relationships between the government's popularity and the incidence of strikes.

4.1 Prima facie relationships between strike incidence and changes in government popularity.

Table 2 describes how protest occurrence and changes in prime minister approval coincide in our dataset. If we look at the aggregate number of strikes, we notice that the majority strikes occur when the popularity of the prime minister is falling. This could indicate that unions target governments when they are weak, i.e. when the government is losing support from the population. On the other hand, this could also indicate that the government is especially unpopular when it has to take harsh austerity measures or implement economic reforms, and that these measures often induce a reaction from trade unions. Several studies deal with the precise nature of this relationship (Boya, Malizard and Agamaliyev, 2010; Dubois, 2007; Gerstlé and François, 2011). When we distinguish between different subcategories of industrial action, we see that more aggresive forms of protest happen when prime minister populariry is increasing rather than decreasing. In the next section, we take the analysis one step further, by distinguishing between strikes of a single day and enduring strikes. While single day strikes may merely serve to express dissatisfaction with government policies, costly enduring strikes will not be started without due consideration. We therefore believe that the choice between a single day strike and an enduring strike depends only on the perceived likelihood of obtaining concessions.

	# observations	% of observations with increasing PM popularity
All strikes	343	43.4
No extra pressure	217	44.2
Demonstrations	74	35.1
Obstructions	41	51.2
Occupations	11	81.8
Long strikes	117	56.4
Concessions	20	65.0

Table 2: Strikes and Changes in Prime Minister Popularity

Several studies examine the often observed correlation between prolonged strikes or protests and the response of strong and weak governments in detail (Tsebelis and Lange, 1995; Gerstlé and François, 2011; Vis, 2009, 2010). This paper contributes to the literature by studying this relationship in a strategic framework. If we believe that unions do not benefit from a long period of strikes that ends without getting concessions, it is reasonable to assume that they will not start such a conflict if they perceive the chance of obtaining concessions to be limited. This introduces a selection bias that can only be dealt with by imposing a strategic structure. In the next section, we investigate whether popularity ratings affect the probability of concessions, and how this translates into outcomes given the unions' strategic choice of action.

4.2 The game theoretic model and statistical backwards induction

Strategic interaction is a fundamental consideration when one wants to study the initiation of and actors' conduct during strikes. Therefore, we apply a model of statistical backwards induction. This model was developed by Muhammet Ali Bas, Curtis Signorino and Robert Walker (2008).

In this section, we present the game tree and the structural model. Next, we discuss the determinants of unions' and governments' payoffs in each of the three outcomes. We conclude this section by presenting the results of our estimations.

The interplay between trade unions and governments that precedes economic policy-making is a very complex process. Both parties' positions may change over time, demands or offers may be made behind the scenes and threaths may or may not be carried out. Furthermore, a party's choice of action may be motivated by elements that go beyond the specific conflicted policy at hand. Following a breach of trust in the recent past, unions may seize the opportunity of rising tensions to settle old scores. If mutual trust has recently been reaffirmed on the other hand, unions may be more acquiescent in subsequent disputes. In short, the true game played by unions and governments is dynamic and extremely complex. On top of that, the actual course of play often remains conceiled from the researcher's eyes. All these elements pose serious challenges to the identification and disentanglement of the forces at work in this process. In this paper, we narrow our focus to a specific part of the process, i.e. those situations in which some form of industrial action can no longer be avoided. We model their interaction as a one-shot game. Although we may ignore important aspects of the overarching game, we believe that uncovering the strategies of governments and unions in this sub-game is crucial to our understanding of

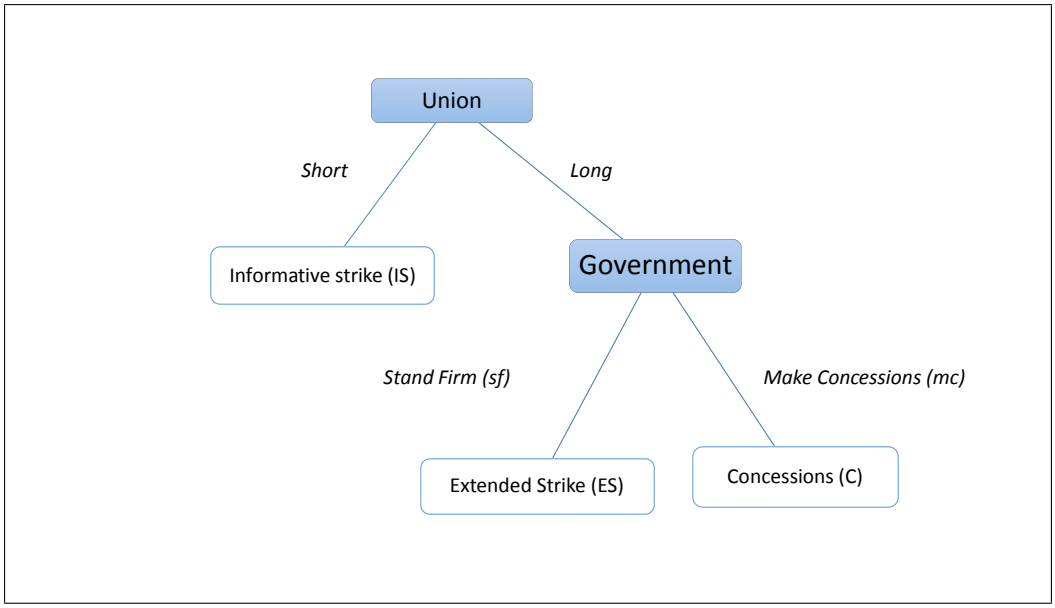

Figure 2: The Strike Game in Extensive Form.

the bigger picture of government-union interaction. In one way or another, the players' strategies in preceding stages (e.g. the government's decision on whether or not to consult the unions, the union's decision on whether or not to end negotiations, etc.) are all based on their respective assessments of the eventual consequences of an open conflict.

Figure 2 presents the strike game in its extensive form. Prior to the beginning of the game, union members have informed their leaders that they are willing to strike to express their discontent with the state of affairs. The object of their dissatisfaction may be a proposed policy reform, a change in working conditions or the lack of government protection against deteriorating economic conditions. The union leaders cannot perfectly estimate the true willingness to strike of all union members, let alone of all affected workers. We assume that the noisy signal from the union members is strong enough to justify at least a single day of industrial action. However, the union leaders still have to decide whether they will limit the strike to a single day or not. A strike of a single day is usually announced beforehand, and all affected parties know that its duration is predetermined. It could therefore be considered as an expression of discontent or at most as a threat to fully engage in a strike conflict later on, rather than a ultimate exacerbation of an ongoing conflict (Lancaster, 1972). When unions enter the second day of a strike, they convey to the government that they are willing to engage in a conflict with an uncertain outcome. In the second stage, the government decides whether or not it will make concessions to the strikers. If concessions are made, the game ends in an agreement. If not, the strike will eventually end.

4.2.1 Structural model

The structural model is rather simple. Because the government observes the union's action, this is a fully recursive model. If we assume that there is no incomplete information about utilities, neither for the players nor for the researcher, the game can be solved by backwards induction for any given specification of the utilities. However, if there is a unique subgame perfect equilibrium for any particular specification of utilities, the above model is not statistical. A statistical analysis requires a probability model that puts positive probability on all the outcomes (Signorino, 2001). This can be done by assuming that players make mistakes in their actions, that they misperceive each other's utilities or that we as analysts have to deal with measurement error or regressor misspecification (Signorino, 2003).

In our analysis, we assume that each player's utility has a private random component. The true value of this component is only known by the player in question, the other player and the analyst only know its distribution.

The government's utilities from making concessions and standing firm are, respectively:

$$U^*_{Gov}(mc) = U_{Gov}(mc) + \alpha_{mc} = U_{Gov}(C) + \alpha_{mc}$$
$$U^*_{Gov}(sf) = U_{Gov}(sf) + \alpha_{sf} = U_{Gov}(ES) + \alpha_{sf},$$

where $U^*_{Gov}(\cdot)$ is the true utility, $U_{Gov}(\cdot)$ is the part of the utility that is observable to the union and to the analyst, and a is a random component of utility which is only observable to the government. We assume that the government maximizes its true utility.

As analysts, we can only derive choice probabilities if we make assumptions about the distribution of the private components of utility. We assume that this distribution is Type I Extreme Value, which results in logit probabilities. More specifically, the probability that the government will make concessions or stand firm are:

$p_{mc} = \frac{e^{U_{Gov}(C)}}{e^{U_{Gov}(C)}+e^{U_{Gov}(ES)}}$ and $p_{mc} = \frac{e^{U_{Gov}(ES)}}{e^{U_{Gov}(C)}+e^{U_{Gov}(ES)}}$, respectively.

We now turn to the union's decision to strike a single day or to start an industrial conflict. If the union strikes a single day, the game ends. The decision to start an industrial conflict however, depends on the predicted action of the government. The union's utilities are hence:

$$U^*_{Union}(short) = U_{Union}(short) + \alpha_{short} = U_{Union}(IS) + \alpha_{short}$$

$$U^*_{Union}(long) = EU_{Union}(long) + \alpha_{long}$$

$$= p_{mc}U_{Union}(C) + p_{sf}U_{Union}(ES) + \alpha_{long}$$

We assume that we as researchers have the same uncertainty as the players. Again, we assume that the private component of the union's utility is distributed Type I Extreme Value. As a result, the probabilities of the union calling a short or a long strike are logit probabilities. However, these probabilities do not take the typical logit form, because they are based on expected utility calculations. The union's probability of calling a short or a long strike are respectively:

$$p_{short}=\frac{e^{U_{union}(short)}}{e^{U_{Union}(short)}+e^{EU_{Union}(long)}}=\frac{e^{U_{union}(short)}}{e^{U_{Union}(short)}+e^{p_{mc}U_{Union}(C)+p_{sf}U_{Union}(ES)}}$$

$$p_{long}=\frac{e^{U_{union}(long)}}{e^{U_{Union}(short)}+e^{EU_{Union}(long)}}=\frac{e^{p_{mc}U_{Union}(C)+p_{sf}U_{Union}(ES)}}{e^{U_{Union}(short)}+e^{p_{mc}U_{Union}(C)+p_{sf}U_{Union}(ES)}}$$

The equilibrium probabilities of the strategic model are hence $(p_{short}, p_{long}, p_{mc}, p_{sf})$. Given that we assume that the uncertainty comes from Type I extreme value perturbations to the action utilities, the above equilibrium is a Logit Quantal Response Equilibrium (McKelvey and Palfrey, 1998; Signorino, 1999; Bas et al., 2007). Because we assume that these perturbations are independently distributed, we can calculate outcome probabilities by multiplying the action probabilities along the path of play. The outcome probabilities are thus:

$$\Pr(IS) = p_{short}$$
$$\Pr(ES) = p_{long} \cdot p_{sf}$$
$$\Pr(C) = p_{long} \cdot p_{mc}$$

Let us now specify the system of latent variable equations on which we build our empirical analysis. We observe the choice of action of the players, and assume that

$$y_{union} = \begin{cases} 1, \text{ if } U^*_{Union}(long) \geq U^*_{Union}(short) \\ 0, \text{ if } U^*_{Union}(long) < U^*_{Union}(short) \end{cases}$$

$$y_{Gov} = \begin{cases} 1, \text{ if } U^*_{Gov}(mc) \geq U^*_{Gov}(sf) \\ 0, \text{ if } U^*_{Gov}(mc) < U^*_{Gov}(sf) \end{cases}$$

where $y_{union} = 1$ and $y_{Gov} = 1$ correspond to the union choosing a long strike and the government choosing to make concessions. The equilibrium action probabilities can hence be written as $p_{long} = \Pr(y_{Union} = 1)$ and $p_{mc} = \Pr(y_{Gov} = 1)$.

The system of latent variables underlying our empirical model can now be specified as:

$$y^*_{Union} = U^*_{Union}(long) - U^*_{Union}(short),$$
$$y^*_{Gov} = U^*_{Gov}(mc) - U^*_{Gov}(sf),$$

with $y_j = 1$ if $y_j^* \geq 0$ and $y_j \geq 0$ if $y_j^* < 0$, for $j \in \{Union, Gov\}$.

The above model is just a strategic random utility model. Once we assign regressors to the utilities of both players, we can estimate action and outcome probabilities using maximum likelihood estimation. Before we specify the regressors, it will be helpful to derive the analytical form of the coefficients using a system with a single parameter and regressor. Let the union's utility under the three different outcomes be specified as:

$$U^*_{union,IS} = \alpha_1 + \beta_1 X_1$$
$$U^*_{union,ES} = \alpha_2 + \gamma_1 X_1$$
$$U^*_{union,C} = \alpha_3 + \tau_1 X_1$$

After normalization, we get:

$$U^*_{union,IS} - U^*_{union,IS} = 0$$
$$U^*_{union,ES} - U^*_{union,IS} = (\alpha_2 - \alpha_1) + (\gamma_1 - \beta_1) X_1$$
$$U^*_{union,C} - U^*_{union,IS} = (\alpha_3 - \alpha_1) + (\tau_1 - \beta_1) X_1$$

The union will choose for a long strike if

$$(1 - \widehat{p}_{mc})(U^*_{union,ES} - U^*_{union,IS}) + \widehat{p}_{mc}(U^*_{union,C} - U^*_{union,IS}) \geq 0,$$

where $\widehat{p}_{mc}$ is the observed probability that the government will make concessions
Given the above specifications, the union's decision rule can be written as:

$$[\gamma_1 - \beta_1 - \widehat{p}_{mc}(\gamma_1 - \tau_1)] X_1 + (1 - \widehat{p}_{mc})\alpha_2 + \widehat{p}_{mc}\alpha_3 - \alpha_1$$

The coefficient of X_1 is $[(1 - \widehat{p}_{mc})\gamma_1 + \widehat{p}_{mc}\tau_1 - \beta_1]$. In order to facilitate interpretation, we have to make additional assumptions about β_1, γ_1 and/or τ_1. Luckily, these assumptions are often very reasonable. If a regressor is only relevant for one outcome, we can safely assume that the other parameters are equal to zero. In our analysis for example, the size or nature of the benefits from concessions will only affect the union's utility once these concessions have been made. For these regressors, we hence assume that $\beta_1 = \gamma_1 = 0$. As a result, the coefficient simplifies to $\widehat{p}_{mc}\tau_1$, which means that we can estimate τ_1 if we multiply X_1 by $\widehat{p}_{mc}$. In other instances, it makes sense to assume that the parameters are identical in two outcomes. For instance, there may be costs related to a long strike that are independent of the government's response. For variables related

to such costs, we assume that $\beta_1 = 0$ and $\gamma_1 = \tau_1$. In this case, the coefficient of X_1 is equal to γ_1 and τ_1.

4.2.2 Payoffs

The distinction between a strike of a single day and a longer strike is particularly relevant when we model the payoffs of union leaders. Assuming that their members' call for action is strong enough to justify at least a one day strike, the union leaders do not jeopardize their position by announcing such a strike. They are certain that their call will be supported by their members, and hence do not risk losing face because of an unsuccessful mobilization. When the true level of worker dissatisfaction is high enough to warrant a longer strike, the union leaders can present their decision as a warning for the counterparty and engage in longer strikes later. By calling out an enduring strike on the other hand, union leaders are putting themselves in a risky position. If they obtain concessions from the government, they increase the utility of their members as well as their own, and reinforce their position as leaders of the trade union. If the strike ends in failure, either because the union leaders underestimated the government's firmness or because they overestimated the support of their members, the leaders positions within the unions may be compromised.

The strategic aspects of strikes are often overlooked, because most studies consider strikes as the result of misinformation. In these models, the actors simply try to inform the adversary about their utilities as good and as quickly as possible. Tsebelis (1993) notes that "there is no obvious reason why this should be how rational actors would behave. In fact, the implicit conception of the actors seems both naïve and to contradict the notion of the rational maximizer that underlies the deductive logic of all these theories. (...) We need to treat incomplete information as a resource, and not just as a limitation"(Tsebelis, 1993, p.141). Our focus on the choice between a strike of a single day and an extended strike, allows us to study the strategic behavior of union leaders and the determinants of the payoffs of both parties in a simple game theoretic framework. These questions cannot be studied if we would model the bargaining process as an infinitely repeated game. The only assumption we have to make is that once union leaders have decided to start an extended strike, they will only call it off when members' support decreased below a particular level. In other words, once the choice for a longer strike is made, the union leaders' fate is in the hands of the government and the union members. If the government makes concessions, they will triumph. If no concessions are made before the union members retreat their support, they will lose face. They cannot, however, secure a higher level of utility for themselves by calling of the strike before support has run out.

We now turn to the payoffs of the government. The government's main concern is that it wants to be reelected. The more it fears that strikes may jeopardize this reelection, the more it will be willing to make concessions. Reelection prospects depend on the evolution of government approval and the time to the next elections. The independent variable that we use to capture the pressure on governments with respect to reelection prospects, is based on the "electoral option model" developed by Alesina, Roubini and Cohen (1997). The electoral option model is based on a measure that allows us to calculate reelection probabilities from polling results while taking the remaining time until the next elections into account. If the next elections will take place in the distant future, there is a strong chance that the polls will change or that previous changes in polling results will be reversed. The parties in office should therefore attach less importance to these polls the further they are from the next elections. The measure of Alesina et al. (1997) is expressed as:

$$\Pr_t^R = \Phi\left[\frac{Q_t^R + \mu m - 50}{\sigma\sqrt{m}}\right]$$

where Φ is the cumulative standard normal distribution, Q_t^R denotes the proportion of citizens who intend to vote for the party in office relative to those who intend to vote for the other party at time t, and m is the number of days until the election. μ is the sample mean of changes in this proportion, and σ is the sample standard deviation of daily changes. This measure is not appropriate for our analysis however, because it is developed for a two party system. Furthermore, we are not interested in predicting the outcome of the next elections and we do not need to express reelection prospects as a percentages. Because our variable is only meant to capture the pressure on the parties in office from reelection prospects and electoral fever, we can use a much simpler specification. This specification is simply the change in approval ratings over the past two months divided by the number of days until the next election.

The literature is still inconclusive on the question whether a strong or a weak political position makes it more probable that the government will withstand protests. The traditional view suggests that a strong position facilitates pushing through unpopular reforms (Garett, 1993; Keeler, 1993; Alesina, Ardagna and Trebbi, 2006). However, when it comes to large-scale reforms such as changes in the pension system this view is not supported by the data. Vis (2010, p.134) observes that

> "In almost all instances of unpopular reform, the government faces a deteriorating socio-economic situation (...) or a weakening political position (e.g. a fall in the polls)."

To explain this observation, she applies the key empirical findings of prospect theory to political decision-making. Prospect theory was developed by Daniel Kahneman and Amos Tversky (1979, 1981, 2000) and deals with decision-making under uncertainty. Compared to expected utility theory, prospect theory offered a more accurate description of decision processes. The key empirical finding of prospect theory is that people are risk averse when they face favorable prospects, but tend towards risk acceptance when they face a deteriorating situation. Vis (2009, 2010) uses the insights of prospect theory to study welfare reforms in four European countries between 1979 and 2005. Her fuzzy-set qualitative comparative analysis provides evidence that a weakening political position of government parties combined with a deteriorating socio-economic situation are sufficient conditions to push through unpopular reforms. Conversely, if the political and economic climate is favorable to the parties in office, they will shy away from adopting risky reforms.

Compared to Vis' (2009) study, we focus on political decisions with a narrow impact. However, the insights from prospect theory are also relevant for the conflicts that we study. When the government chooses not to concede it runs the risk of being associated with social unrest, which decreases its chances of winning the next elections. Making concessions to strikers is arguably the less risky option. In this case prospect theory predicts that governments are more likely to make concessions when approval ratings are increasing.

This prediction can also be explained by an argument that does not entail difference in risk aversion. When the government's popularity is increasing and elections are near, it may pay to make concessions in order to shift the media's attention away from the frustrated workers and back to more popular policies. If popularity is decreasing, the benefits from such a shift are smaller, because the focus of attention will be moved to other but perhaps equally unpopular policies. Furthermore, the reversal of the contested policy is more likely to be considered as a sign of weakness if the government is already in a weak position (reference needed).

Losing an election is not the only way in which a government may lose office. If the government is internally instable, the likelihood that social unrest induces a political crisis increases. Furthermore, unions are more likely to find an ally within the government when this government is ideologically dispersed. Therefore, we expect that instable governments are more likely to make concessions when unions engage in an extended strike. Finally, concessions have a budgetary cost that should be taken into account. The extent of this cost depends on the specific issue. Regardless of the exact amount, the government will be more likely to make concessions when it is less restricted by budgetary concerns.

The union leaders' payoffs depend on the utility of union members and the security of their position within the organization. The unions' members and leaders have the

	Concept	Variable
Utility union leaders (concessions)	Wage loss	Service sector
	Net gains	Non-excludable benefits
Utility union leaders (conflictual strike)	Wage loss	Service sector
	Damage to reputation / leadership	Net density
		HH concentration index
		C3-index
Utility government (concessions)	Electoral impact	$\frac{\Delta PM - approval}{\#days\ until\ election}$
		$\frac{\Delta PR - app * Cohab}{\#days\ until\ election}$
	Stability of government	Cohabitation
	Disruptive potential	Share Force Ouvrière
		Share CFDT
		C3- index
		HH concentration index
	Cost of concessions	Budget Surplus

Table 3: Determinants of the Players' Utilities.

same preference ordering over the three outcomes: They prefer government concessions to an informative strike, and an informative strike to conflictual strike. As noted above, announcing a strike for a single day is the safer option. The payoffs of a one day strike are certain, and independent of the government's strategy. Therefore, we will normalize these payoffs to zero in our empirical analysis below, and compare the payoffs of the other two outcomes to those of the informative strike.

Irrespective of the government's response, workers lose (part of) their income during strikes. The larger this loss, the less likely it should be that unions engage in enduring strikes. The monetary loss depends on a large number of factors such as economic sector competitiveness, wage levels, collective bargaining agreements and even seasons, and is therefore hard to include in an empirical analysis.

For our empirical analysis of strikes against the government in France between 1988 and 1995, we use the following variables as determinants of the payoffs:

As discussed above, the union leaders' payoffs in the event of an informative strike are normalized to zero. Their most preferred outcome is 'concessions'. The payoffs will depend positively on the net gains from the concessions made by the government. These will be larger when the concessions exclusively benefit the members of the union in question and the workers who took part in the strike. If this is not the case, the union

members might have enjoyed the same benefits without incurring the costs from taking part in the strike. On a more psychological or organizational level, the union leader's position will be stronger if successfully secures the specific interests of the union members. The largest cost of an enduring strike is the loss of income. In France, the loss of income is smaller in the service sector due to national labor legislation. We will therefore include a binary variable indicating whether the strike takes place in the service sector.

The payoffs of union leaders in a conflictual strike consist of income loss and reputational damage. The reputational damage depends of the perceived share of responsibility for the failure that can be attributed to the union leader. If there are several unions in the sector, and if only a small percentage of the workers are union members, it is easier for the leaders to blame someone else for the failure. In our analysis, we use three different variables to capture the reputational damage: the net density, or the percentage of unionized workers in the sector; the Herfindahl-Hirschman concentration index, or the sum of squared union-shares in the sector; and the C-3 concentration index, or the aggregate share of the 3 largest unions in the sector.

The payoffs of the French government in the outcome 'conflictual strike' are normalized to zero. The payoffs in the event of concessions depend on the electoral impact of the strike, internal stability of the government, the disruptive potential of the strike and its budgetary cost. Despite the strong position of the president in the French fifth republic, economic and social affairs are usually considered to be part of the competence of the prime minister. Many scholars argue that when economic conditions deteriorate, the French prime minister is often used as a scapegoat by the president (Lewis-Beck, 1980; Capron, 1987). A recent empirical study by Boya, Malizard and Agamaliyev (2010) confirm this. Therefore, strikes and protests are often targeted at the prime minister. This is even more clear when the president and the prime minister belong to different political parties. In these so-called periods of cohabitation, an unwritten rule prohibits the president to interfere with internal economic and social affairs. A study of pilot surveys conducted by Lewis-Beck (1997) confirms that in periods of cohabitation, the voters hold the prime minister accountable for economic affairs. However, when legislative elections approach, an increase in the popularity of the president may put pressure on the prime minister. In periods of cohabitation, we therefore also include the change in presidential approval as a determinant of the government's payoffs.

The stability of a cabinet may influence its likelihood to make concessions to protesters. In our analysis, the internal stability of government is proxied by the binary variable 'Cohabitation'.

The disruptive potential of the strike depends on the union's ability to get media coverage, to disrupt normal economic activities, and to win the support of the general

Variables	**N**	**mean**	**St. Dev.**	**min**	**max**
Budget Surplus	343	-4.007	1.305	-6.152	-1.903
Prime Minister Approval	343	0.000379	0.0606	-0.667	0.500
Pr. Approval in Cohabitation	343	-0.00725	0.0509	-0.412	0.0952
Service Sector	343	0.274	0.447	0	1
Net Density	343	9.264	0.633	8.600	10.70
Share Force Ouvrière	343	0.209	0.0566	0.00800	0.269
Share CFDT	343	0.241	0.135	0	0.554
C3-Index	343	0.811	0.0993	0.239	0.902
HH-index	343	0.281	0.0549	0.214	0.563

Table 4: Table Caption

public. In our analysis, we use 4 different variables that relate to the union's capacity to put the government under pressure. The first two are the share of the most militant union 'Force Ouvrière' and the share of the most cooperative union 'CFDT' in the sector in question. The third and fourth variable measure the concentration of syndical power. We assume that concentration of power facilitates disruptive industrial action or at least poses a larger and more credible threat. Concentration is measured via the Herfindahl-Hirschman index and the C3-index which we discussed earlier.

As argued above, it is difficult to obtain reliable estimates of the budgetary costs of concessions. In our analysis, we use the budget surplus that was realized in the year the strike ended (with or without concessions).

4.2.3 Results

Table 4 presents summary statistics for the variables used in the analysis below.

t statistics in parentheses
* p < 0.10, ** p < 0.05, *** p < 0.01

We start by analyzing the government's decision in the final stage. Because the government's decision to make concessions or not is the final action in the game, we use a logit model to estimate the determinants of the latent variable, i.e. the government's utility. The results are presented in Table 5. Out of 117 long strikes, 20 ended with concessions made by the government. Therefore, we also estimate this stage with Gary

	(1)	(2)	(3)
	Government Concessions	Government Concessions	Government Concessions
Prime Minister Approval	93.47*	96.18*	95.30*
	(1.65)	(1.89)	(1.77)
Cohabitation	1.353*	1.370**	1.240*
	(1.88)	(2.00)	(1.82)
Budget Surplus	0.571**	0.493*	0.542**
	(2.02)	(1.85)	(1.99)
President Approval During Cohabitation	-19.53*	-16.09	-17.81
	(-1.67)	(-1.22)	(-1.54)
Share Force Ouvrière	25.58**		
	(2.00)		
Share CFDT	2.174		
	(0.46)		
C3-index		2.960	
		(0.80)	
HH concentration-index			-13.74
			(-1.44)
Constant	-6.854**	-3.151	3.192
	(-2.09)	(-0.97)	(1.16)
Observations	106	106	106

Table 5: Regression Results Final Stage

King's rare-event logit model (King, 2001). Because this approach does not produce significantly different results, we include the results in the appendix.

We see that the government is more (less) likely to make concessions when the prime minister's popularity is increasing (decreasing), especially when on the verge of legislative elections. Interestingly, it does not matter whether the incumbent government is leftwing or rightwing. We interpret this as an indication that the parties in office do not expect to win votes based on their response to the unions' actions. Even rightwing governments that are gaining popularity prefer to settle the issue by means of concessions, rather than taking a firm stance in the hope of being rewarded by their electorate. As an incumbent government, being associated with industrial conflict will never pay off at the ballots, regardless of the ideological orientation of their supporters.

If conflict deteriorates reelection prospects, then why should the government's willingness to make concessions depend on whether approval ratings are increasing or decreasing? First of all, changes in popularity affect the expected benefits of getting the conflict of the table. Close to elections, the governing parties will try to direct the public's attention towards those policies that proved to be popular. Increasing popularity ratings indicate that the government's positions on the other political issues with media coverage at that time, are on average well received by the public. Therefore, the probability that the media's attention shifts away from the settled conflict towards policies with a lot of popular support increases when approval ratings are on the rise. When popularity is decreasing the benefits from settling the conflict will be smaller, because it is still likely that the media will shift their focus to another unpopular issue.

Furthermore, unions have a higher chance of getting concessions when the budget deficit is small and when they are in a period of cohabitation (possibly due to a lower level of internal stability in the government). The effect of changes in the president's popularity in times of cohabitation has the expected sign, and has a significant impact on the government's decision to make concessions or not. Finally, the share of the industry occupied by the militant union "Force Ouvrière" has a significant positive impact on the likelihood that the government will make concessions. The share of the CDFG on the other hand, has no effect, even though this union has/had close connections with the Socialist Party. The industry share of both unions has a similar effect on government concessions during leftwing and rightwing governments.

We find no evidence for Tsebelis' (1995) hypothesis that the unions' degree of dispersion (or concentration) is an important determinant of success in bargaining with the government in times of industrial conflict. Neither the Hirschman Herfindahl nor the C3- concentration index affects the government's decision with respect to concessions significantly.

To estimate the determinants of unions' utility in the first stage, we multiply the respective payoff variables with the predicted probability that the government will make concessions (or not). The income loss incurred during the strike does not depend on the government's response. Therefore, we include it in the payoffs of the outcomes "agreement" as well as "conflict". The benefits of concessions however, can only be enjoyed when the government chooses to make concessions. The reputational damage of union leaders on the other hand, should only occur when the government does not make concessions. Therefore, we multiply these variables with the predicted probability that the government will concede or will not concede, respectively. These predicted probabilities are based on the value of all the determinants of the government's response in the second stage.

Table 6 presents the results of logit models of the union's decision in the first stage. Because the variables have been transformed using predicted probabilities of the second stage, distributional assumptions of logit models are no longer fulfilled. If we were to use logit to estimate this strategic model, our parameter estimates would be biased and inconsistent (Signorino and Yilmaz, 2003). Curtis Signorino (1999, 2002, 2003) developed a method to deal with these issues. Using his system estimator the parameters of the entire model are all estimated simultaneously, which results in unbiased and consistent estimates. Bas, Signorino and Walker (2008) provide an alternative technique to estimate recursive statistical strategic models. Because listwise deletion of missing observations in the system-approach resulted in a needless loss of data, we used Bas, Signorino and Walker's (2008) method. The procedure consists of estimating the recursive system equation-by-equation, thereby using a form of nonparametric bootstrap to calculate the standard errors of the union's parameter estimates. Because the union's choice of action depends on the expected choice of the government, a correction for the presence of a random action probability is necessary. This correction is not necessary for the parameter estimates of the government's choice.

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The independent variables are all significant and have the expected sign. Because the loss of income is lower in the service sector, the unions are less reluctant to start an enduring strike. If potential concessions will benefit the general public or a group considerably larger than the workers of a specific industry, the expected utility of an enduring strike decreases. The reputational damage associated with losing the conflict will be higher if the leadership of the striking unions is concentrated. When this is the case, the expected utility of enduring strikes decreases and union leaders will be more inclined to limit industrial action to a single day.

	(1)	(2)	(3)
	Extended Strike	Extended Strike	Extended Strike
Non-Excludable Benefits	-3.885*	-4.039*	-3.824*
	(-1.88)	(-1.93)	(-1.88)
Service Sector	0.621*	0.527*	0.641**
	(1.96)	(1.73)	(2.01)
Net Density Unions	-0.0649***		
	(-3.63)		
HH concentration-index		-1.982***	
		(-3.62)	
C3-index			-0.755***
			(-3.67)
Observations	277	277	277

Table 6: Regression Results First Stage

4.3 Electoral pressure, power sharing arrangements and strike occurrence.

In this final section we study how short term political forces and quasi-constitutional power sharing arrangements affect action and outcome probabilities in our game of strikes against the government. First, we analyze the impact of electoral pressure on strike occurence in depth, thereby fully exploiting the strategic nature of our model. Next, we investigate whether alternative arrangements regarding the division of power in periods of cohabitation would increase or decrease the number of enduring strikes.

4.3.1 The effect of electoral pressure.

In the previous section, we found that electoral pressure increases the likelihood that the government is prepared to make concessions. This finding comes with two important caveats. First, the effect of electoral pressure on the government's choice of action is not necessarily linear, and it depends on the value of the other covariates. Second, it is important to distinguish between action probabilities and outcome probabilities. An

increase in the probability that the government will make concessions (action) does not necessarily translate into a decrease in the number of enduring strikes (outcome).

Figure 3 illustrates how electoral pressure affects the predicted action probability that the government will make concessions, and the predicted outcome probability of concessions.. Because the marginal effects of approval ratings on the government's utility depend on the values of the covariates, we study three different situations. In the high risk – low cost case, the disruptive potential of the strikes is large and budgetary restrictions are loose. We approximate this situation by fixing the share of the militant union Force Ouvrière at the 90th percentile of its distribution and fixing the budget surplus at the 10th percentile. In the low risk – high cost case, the covariates are set at their 10th and 90th percentile respectively. In the baseline case, all covariates are set at their means. We see that decreasing approval ratings have a limited effect on the governments' predicted action. In the low risk case, the effects are negligible. When approval ratings are on the rise, the probability that the government will make concessions increases considerably. However, the disruptive potential of the strike and budgetary restrictions can reinforce or moderate the impact substantially. It is worth noting that the predicted probability of concessions as an outcome is not affected by approval ratings to the same extent. This is due to the fact that the outcome depends both on the union's decision and on the government's response.

Figure 4 depicts predicted outcome probabilities of industrial conflict and illustrates that strategic models can broaden our understanding of the occurrence of prolonged protests.

First of all, we observe that industrial conflicts are more likely to occur when disruptive potential is large and budgetary restrictions are not too tight. Second, the dashed line indicates that in the high risk – low cost case the probability of an industrial conflict increases with approval ratings. The factors that increase the likelihood that the government will make concessions will under some circumstances result in more, and not less enduring conflicts. Both findings can be explained as the result of the strategic behavior of unions. If the unions perceive their chances of obtaining concessions to be limited, they will not take the risk of starting a prolonged strike. If they believe they have a fair chance of winning the conflict, they will be more willing to engage in an enduring strike.

To clarify this point, it is useful to write down the probability of conflict explicitly. The outcome probability of an enduring conflict is:

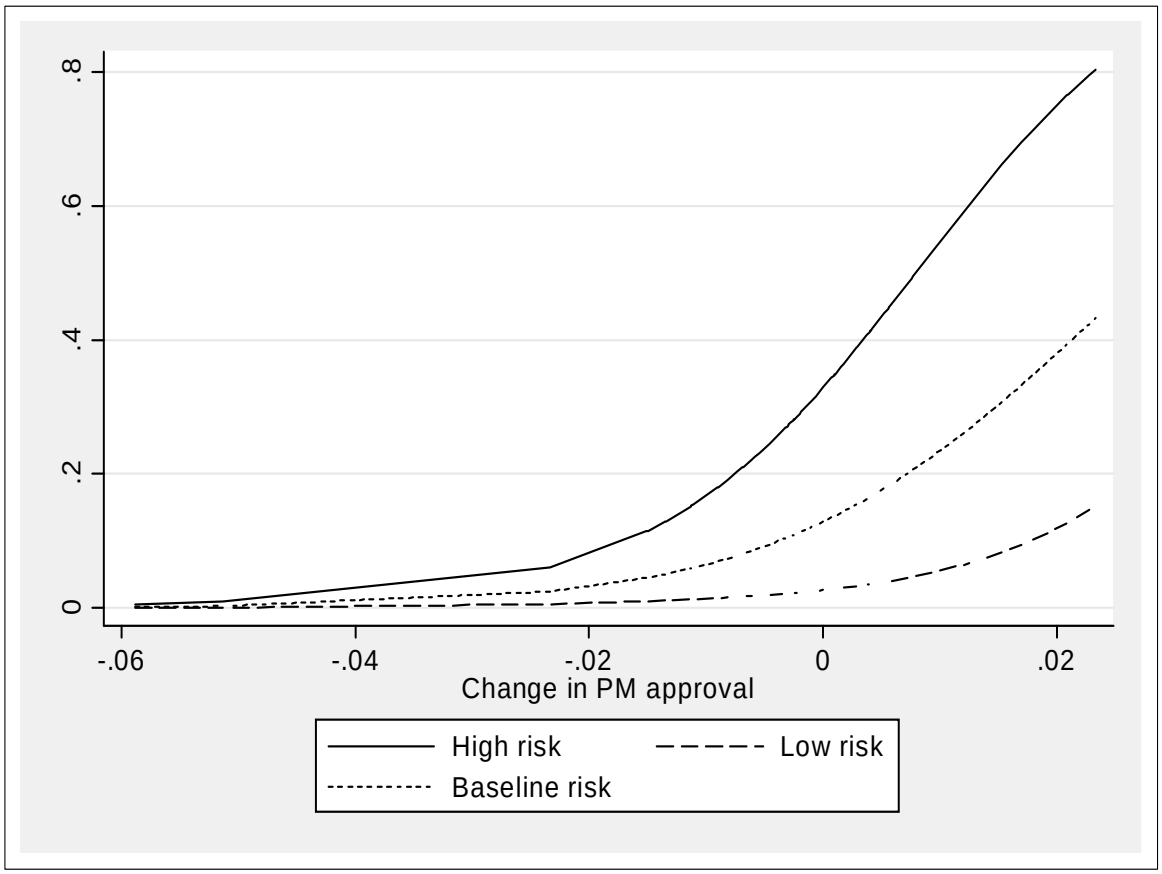

Figure 3: Predicted Action Probabilities: Concessions.

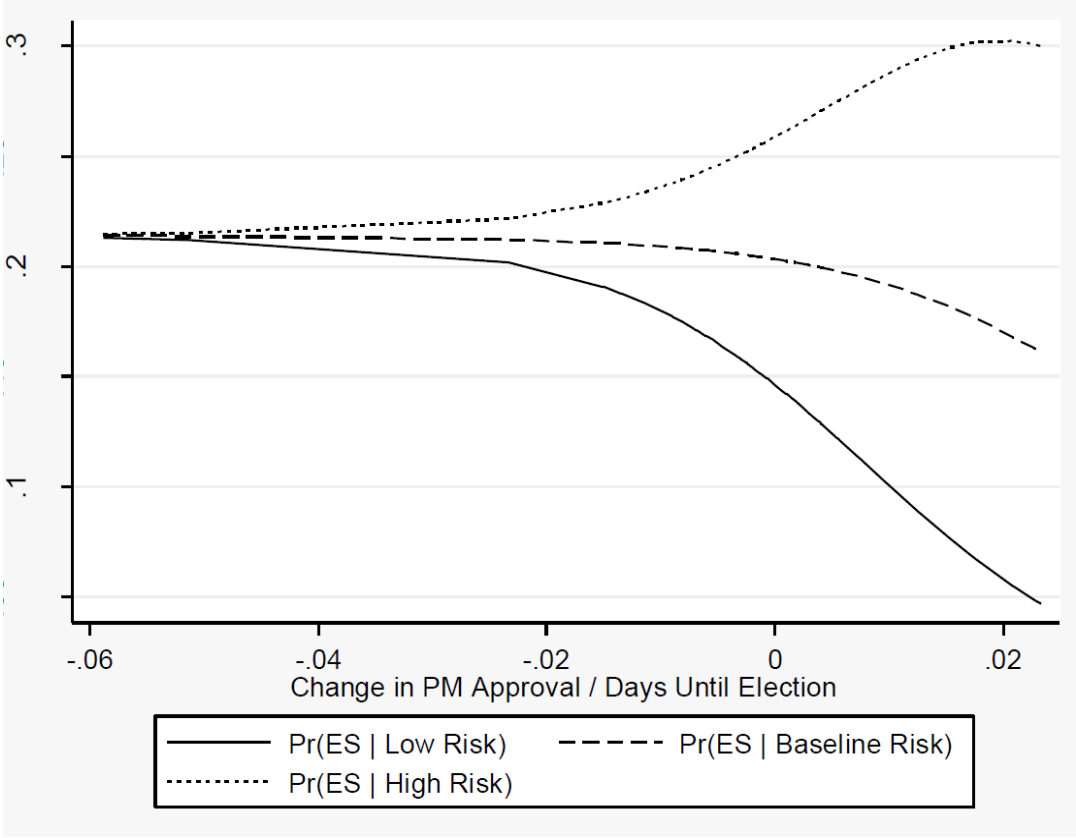

Figure 4: Predicted Outcome Probabilities: Enduring Strike.

$Pr(Conflict) = Pr(ActionUnion = LongStrike|Circumstances) * Pr(ActionGovernment = StandFirm|LongStrike, Circumstances)$

If the increase in the number long strikes started by the unions outweighs the increase in the likelihood that the government will make concessions, the number of enduring industrial conflicts will rise. If we would study which factors affect the likelihood of enduring conflict without taking the strategic behavior of the unions into account, we might find that the popularity of the government increases the likelihood of prolonged strikes. However, it would be wrong to deduct from this finding that strong governments are less susceptible to unions' threats of prolonged conflict. Our model shows that they are more susceptible to threats, but that the strategic behavior of union leaders can lead to an increased probability that these threats will have to be carried out.

4.3.2 Power sharing arrangements under cohabitation.

The sharing of budgetary powers between the president and the prime minister varies considerably in semi-presidential systems. Lienert (2005) compares the budgetary authority of the legislatures in presidential, semi-presidential and Westminster forms of government[1], and concludes that differences between countries with a semi-presidential system are at least as great as the differences across different forms of government. Most countries with a semi-presidential system confer the right to introduce the finance bill to the legislature to the prime minister (Choudhry and Stacey, 2013)[2]. However, the exclusive right of legislative initiative in budgetary matters does not completely shield the prime minister from presidential interference. In semi-presidential systems, there are many ways in which the president can limit the prime minister's budgetary room for maneuver. For instance, the president may have influence on central bank policies, or may have the authority to set long-term spending limits.

In France, power sharing in budgetary policy is particularly relevant when the president and prime minister belong to different political parties. In these periods of cohabitation, the president's power is limited to the so-called "domain réservé". Budgetary power and responsibilty are part of the "domain surveillé", which means that in normal times the president can exercise limited control on these issues. In times of cohabitation however, a

[1] A presidential systems, the head of government is also head of state and leads an executive branch that is separate from the legislative branch. In parliamentary systems fashioned after the Westminster system, the prime minister is the presiding and actual head of the government. Because he or she is usually also a member of parliament, the prime minister is expected to ensure the passage of bills through the legislature. In semi-presidential systems, a popularly elected fixed term president exists alongside a prime minister and Cabinet who are responsible to the legislature of a state.

[2] Exceptions are Peru ans Senegal, where the president has the legislative initiative over budgetary matters.

	Actual Outcomes	Pred. Outcomes	Strong Pres.	Ceremonial Pres.
Inf. Strike	207	248	243	253
End. Strike	116	90	84	87
Concessions	20	5	16	3

Table 7: Counterfactual Analyses

quasi-constitutional custom prohibits presidential interference in budgetary matters. In this final section, we investigate whether different power sharing arrangements between a president and prime minister from different political parties would increase or decrease the number of enduring industrial conflicts.

Given that the president is responsible for the implementation of international treaties, the ultimate budgetary responsibility has been the object of discussion when the Stability and Growth Pact entered into force. The disagreement about the budgetary competence was soon settled in favor of the prime minister. In our first counterfactual situation, the president remains responsible for the budget in a situation of divided government. We approximate this situation by setting the coefficient of the budget deficit to zero in periods of cohabitation. As we see in the fourth column of Table 7, our counterfactual analysis predicts that the unions would choose for a long strike more often. The number of enduring conflicts would decrease however, because the government is more likely to make concessions. The counterfactual budgetary responsibility of the president hence seems to create a third-party payment problem. Despite the predicted decrease in the number of enduring industrial conflicts, the separation of decision-making and budgetary responsibility is not an advisable alternative. In this regard, the French power sharing arrangement is in line with the expression "*qui paie les violons, peut choisir la musique*"[3].

In the second counterfactual situation, the president has a mere ceremonial role. The government is entirely independent, and even in times of cohabitation presidential popularity does not affect political pressure on the government. Furthermore, the partisan affiliation of the president does not indicate whether or not the government is stable. In other words, cohabitation itself has become irrelevant to the day-to-day functioning of the government, and therefore no longer implies a "divided government". We approximate this situation by setting the coefficient of the variables cohabitation and presidential approval to zero. The results are presented in the fifth column of Table 7. We see that unions engage in long strikes less often. Because an asymmetric party political composition of the executive power does not make the cabinet prone to internal pressure

[3] *"He who pays the piper calls the tune."*

or instability, the government will no longer seek refuge in concessions to safeguard its continuity. Union leaders realize this, and will choose to avoid an open conflict more often.

5 Conclusion

In this paper, we studied union strikes against the government in a strategic setting. A central question in studies of general strikes and protests against the government, is whether the government is more likely to make concessions when its popularity is decreasing or increasing. So far, the literature remains inconclusive.

Our paper contributes to the literature by imposing a strategic structure to the empirical analysis. Unlike previous studies, we take into account that the union leaders are forward looking. This assumption is justified by the observation that union leadership is characterized by a rising level of professionalism, and that unions have close connections with political institutions. Therefore, union leaders are well equipped to assess the adequacy of engaging in an open conflict with the government at a certain time. This means that they will avoid an enduring confrontation if they believe that the likelihood of obtaining concessions is too small. If we do not impose a game theoretic structure, our analysis would therefore suffer from a selection bias.

Using data on all strikes against the government between 1988 and 1995, we find that governments are more likely to make concessions when elections are near and their popularity is increasing. Vis (2009, 2010) explains a similar finding using key insights from prospect theory. She argues that like individuals, governments are more risk averse when they have optimistic prospects on the future. We offer an alternative explanation by taking media attention into account. Our results also indicate that governments take the obstructive potential of the strikers into account, and are hence more susceptible to pressure when the most militant unions have a large share in the industry.

By introducing forward looking unions, we offer an explanation for the observation that long lasting conflicts often occur when elections are close and the parties in office are doing well at the polls. Paradoxically, these are precisely the circumstances under which governments are more likely to make concessions. Because strategic behavior of union leaders can lift this paradox, we believe that our strategic model presents an interesting refinement on the existent literature.

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